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US-USSR SCIENTIFIC EXCHANGE PROGRAM IN THE FIELD OF POLYMER CON--ETC(U)
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MISCELLANEOUS PAPER SL-79-3

US-USSR SCIENTIFIC EXCHANGE PROGRAM IN THE FIELD OF POLYMER CONCRETE

by

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January 1979
Final Report

Prepared for Office, Chief of Engineers, U. S. Army
Washington, D. C. 20314

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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER (14) WES-MP- Miscellaneous Paper SL-79-3	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) (6) US-USSR SCIENTIFIC EXCHANGE PROGRAM IN THE FIELD OF POLYMER CONCRETE,	5. TYPE OF REPORT & PERIOD COVERED (9) Final report, 5
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) (10) John M. Scanlon	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U. S. Army Engineer Waterways Experiment Station Structures Laboratory P. O. Box 631, Vicksburg, Miss. 39180	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office, Chief of Engineers, U. S. Army Washington, D. C. 20314	(11) 12. REPORT DATE January 1979 / 13. NUMBER OF PAGES 9
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) (12) 12p.	15. SECURITY CLASS. (of this report) Unclassified / 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

(18) (19)

18. SUPPLEMENTARY NOTES

This is CTIAC Report No. 35. The report is a paper presented at the Second International Congress on Polymers in Concrete, Austin, Texas, 25-27 October 1978.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Polymer concrete
Scientific exchange
Technology transfer
US-USSR scientific exchange program

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The US-USSR scientific exchange program in the field of polymer concrete was initiated in 1974; it has been one of the more active exchanges and as a result of this activity, three Soviets presented technical papers at the Second International Congress on Polymers in Concrete, held at the University of Texas, Austin, 25-27 October 1978. This report generally describes the US-USSR exchange programs in various areas and in particular the exchange programs pertaining to the Water Resources Working Group.

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038100 1B

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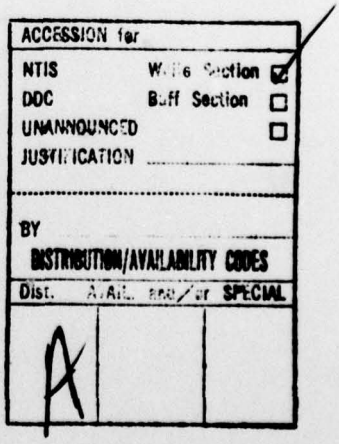

PREFACE

This paper was prepared for presentation at the Second International Congress on Polymers in Concrete. This conference, sponsored by the American Concrete Institute, the Federal Highway Administration, and the University of Texas at Austin, was held 25-27 October 1978 in Austin, Texas.

Funds for the publication of this paper were provided from those made available for operation of the Concrete Technology Information Analysis Center (CTIAC). This is CTIAC Report No. 35. The paper was prepared by John M. Scanlon, Chief, Engineering Mechanics Division, Structures Laboratory (SL), US Army Engineer Waterways Experiment Station (WES). The paper was prepared under the general supervision of Mr. Bryant Mather, Acting Chief, SL.

The Commander and Director of WES during the preparation and publication of this paper was COL J. L. Cannon, CE. Mr. F. R. Brown was Technical Director.

US-USSR Scientific Exchange Program in the Field of Polymer Concrete

by

John M. Scanlon*

INTRODUCTION

Included in the International Congress as part of the official program are three papers which will be presented by three members of the USSR Polymer Concrete Scientific Exchange Team, and we the members of the US Polymer Concrete Scientific Exchange Team would like to believe that we contributed in getting them to participate.

In the spirit of improving US-USSR relationship, along with arms control, disarmament agreements, and various Strategic Arms Limitation Talks (SALT), many exchanges and cooperative agreements have been consummated by the United States and the Soviets. Cultural, educational, scientific, and technical exchanges have long constituted an important element in our relations with the USSR. Since 1958, we have signed a continuing series of bilateral agreements to promote such activities and to provide the framework for their implementation by both private and governmental organizations. The 1975 Helsinki Final Act also supports increased contact and exchanges.

The current US-USSR "umbrella" agreement on Cultural Relations was signed in Washington, DC, 19 June 1973. To put exchange activities on a firmer basis, the agreement was made valid for 6 years instead of the 2-year periods characteristic of earlier agreements. Annexed to the agreement is a "Program of Exchanges" which provides more detailed guidelines for implementing educational exchanges, performing arts groups, official publications (Soviet Life and America), and circulating exhibits.

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In addition to its longer-term feature, the 1973 agreement foresees continuing expansion by establishing minimum-floor levels for several exchange categories, rather than setting maximum targets as in the past. Also, in the educational field, exchanges of university lecturers were added to existing programs for graduate students, senior scholars, and professional symposia participants. Activities in 1977 included the reciprocal exchange of nearly 50 graduate students, monthly distribution in each other's country of 62,000 copies of "America" and "Soviet Life," respectively, and tours of six Soviet cities by the "Photography USA" exhibit. Under a separate agreement, the United States mounted a Bicentennial exhibit in Moscow in late 1976, and the USSR staged a similar event in Los Angeles in November 1977 commemorating the 60th Anniversary of the 1917 Soviet Revolution. Parallel to governmental programs, privately organized exchanges have been steadily growing in many fields - a noteworthy development in 1976-77 was signature of the first two direct exchange agreements between Soviet and US universities.

SCIENCE AND TECHNOLOGY

At the 1972 Moscow Summit, building on exchanges conducted under the earlier biennial general agreements, the two Governments agreed to a significant expansion of bilateral cooperative programs in scientific fields. Four agreements were signed, each with 5-year terms, providing for cooperative activities in environmental protection, space, medical science and public health, and science and technology. At subsequent summit meetings - 1973 in Washington and 1974 in Moscow - similar agreements were added in the fields of agriculture, atomic energy, oceanography, transportation, housing and other construction, and development of an artificial heart. Although government agencies have the lead in carrying out programs, there is extensive involvement of the US academic and business communities.

The agreements are implemented through a structure of joint committees with policy-level officials from both countries who generally meet once a year to approve areas selected for cooperation and to review progress. Joint working groups of specialists meet periodically to refine programs further and direct specific project implementation. Emphasis in cooperation

is placed on joint research to achieve concrete results of scientific and technical benefit by drawing on complementing capabilities of the two countries. In 1977 well over 200 separate projects were under way, and approximately 1000 program participants were traveling annually each way in connection with agreement activities. In 1977, the four agreements signed in 1972 and the artificial heart agreement of 1974 were extended for additional 5-year terms, taking their validity into mid-1982.

WATER RESOURCES WORKING GROUP

The US-USSR Joint Working Group on Cooperation in the Field of Water Resources was established on 24 May 1972, and since that time four joint sessions have convened to review the program and to plan for the future. Dr. W. S. Butcher, US National Science Foundation, was the first US Chairman and Mr. I. I. Borodavchenko, Deputy Minister, USSR Ministry for Reclamation and Water Management, served as the USSR chairman. The Water Resources Working Group has been one of the more successful programs in the Science and Technology Exchange Program. Mr. R. Keith Higginson, US Bureau of Reclamation Commissioner, assumed the chairmanship of the US Working Group following the 1978 meeting in Washington, DC. The Water Resources Working Group is composed of three primary projects containing a total of 10 technical teams.

PROJECT I-I, "PLANNING, UTILIZATION, AND MANAGEMENT OF WATER RESOURCES" (01.1201)

Team No.	Team Title	Team Leader
1	Design of Large Canals	E. J. Carlson, USBR
2	Construction of Large Canals	B. Levine, USBR
3	Design and Construction of Pumping Plants	C. G. Bates, USBR
4	Water Management Systems within a River Basin	J. D. Ellingboe, USBR
5	Use of Industrial, Agricultural, and Municipal Waste Water for Irrigation	N. W. Urban, Corps of Engineers
6	Effective Use of Saline Irrigated Lands and Saline Water for Irrigation	M. B. Bessler, USBR

PROJECT II-3, "PLASTICS IN HYDROTECHNICAL CONSTRUCTION FOR 1978-1982"
(01.1204)

Team No.	Team Title	Team Leader
1	Design and Technology of Plastic Films for Irrigation Canals and Reservoirs and Utilization of Polymers for Soil Stabilization on Slopes (Short Title - Plastic Films)	L. O. Timblin, Jr., USBR
2	Investigation of Effectiveness of Plastic Pipe in Drainage and Irrigation Structures (Short Title - Plastic Pipe)	W. J. Ochs, SCS
3	Use of Polymer Concrete for Wear-Resistant and Cavitation-Proof Linings of Hydraulic Works, as well as for Repair of Concrete Structures (Short Title - Polymer Concrete)	J. M. Scanlon, Corps of Engineers

PROJECT III-2, "METHODS AND MEANS OF AUTOMATION AND REMOTE CONTROL IN WATER RESOURCES SYSTEMS FOR 1978-1980"
(01.1203)

Team No.	Team Title	Team Leader
1	Automation of Irrigation Systems	D. F. Nelson, USBR

Each of the team leaders is a member of the Water Resources Working Group.

POLYMER CONCRETE TEAM

During a joint US-USSR meeting of Project II-3, Plastics in Hydrotechnical Construction," in Moscow during September 1974, the polymer concrete program was established. The title of the team became "Utilization of Polymer Concrete in Wear- and Cavitation-Resistant Linings of Hydrotechnical Structures and for the Repair of Concrete Structures." US sponsor for this program is the US Army Corps of Engineers. USSR sponsors are the USSR Ministry for Land Reclamation and Water Management and Ministry of Power Engineering. The original plan was not to

have official team visits, but during an official visit to the USSR in 1975 to attend the RILEM Second International Congress on Winter Concreting, the writer visited Dr. P. I. Kovalenko, Director of the Ukrainian Scientific Research Institute of Hydraulic Engineering and Land Reclamation in Kiev, and after discussing for three days each country's various involvements in the field of polymer concrete, we decided to schedule exchange visits. The purpose of the joint effort is to exchange information on present knowledge and develop joint efforts in future research and project developments in all phases of polymer concrete. Both teams feel that the program has been very beneficial and has improved the knowledge of polymeric materials in each country. The official US team is composed of the following:

John M. Scanlon (Team Leader)	Corps of Engineers
James Clifton	National Bureau of Standards
Ben C. Gerwick, Jr.	University of California - Berkeley
Lawrence E. Kukacka	Brookhaven National Laboratory
Carl E. Selander	US Bureau of Reclamation
Rudolph C. Valore, Jr.	Valore Associates
M. Gunasekaran	
James Dikeou	Dikeou Associates
Robert Philleo	Corps of Engineers
Michael T. McNerney	Tyndall Air Force Base

USSR specialists in the field of polymer concrete who have been directly involved in the program are:

P. I. Kovalenko (Team Leader)	Director, Ukrainian Scientific Research Institute of Hydraulic Engineering and Land Reclamation (Kiev)
A. K. Kamaldinov	Deputy Chief, Main Technical Department, USSR Ministry of Land Reclamation and Water Management (Moscow)
V. V. Paturoyev	Chief of Laboratory of Polymer Concrete, Scientific Research Institute for Concrete and Reinforced Concrete (Moscow)

Yu. M. Bashenov	Dean of Construction Technological Faculty, Moscow Institute of Civil Engineering (Moscow)
T. M. Mahmudov	Chief of Polymer Group, Central Asia Scientific Research Institute of Irrigation (Tashkent)
L. A. Igonin	Chief of Department of Scientific Research Center of Hydroproject (Moscow)
V. B. Reznik	Head of Department, Scientific Pesearch Institute of Hydraulic Engineering and Land Reclamation (Kiev)
R. G. Yazev	Scientific Research Center of Hydroproject
J. M. Yelshin	Scientific Research Center of Hydroproject
Ivan E. Putlyaev	Scientific Research Center of Hydroproject

There have been many accomplishments, but the principal ones are:

(1) The US team has visited the USSR two times and during these visits:

a. Received approximately 50 items of literature pertaining to the field of polymer concrete.

b. Visited seven Institutes performing research in polymer concrete and six field sites where polymer or polymer-impregnated concrete was being used or had been used.

c. Many technical presentations were made.

d. A spirit of excellent cooperation existed.

(2) We are presently conducting the second US tour for the USSR team and upon completion they will have:

a. Visited five major research centers.

b. Received approximately 50 items of literature pertaining to polymeric concretes.

c. Visited six projects where polymeric materials either had been or were being used.

d. Participated in this Second International Congress on Polymer Concrete.

(3) Jointly we have prepared a draft glossary of terms relating to polymer concrete, exchanged tons of polymeric materials, and plan to exchange a specialist during 1979-80 for a period of approximately six weeks.

The USSR literature received by the US team is reviewed, translated, and is furnished various information systems. During 1979, the USSR team will return to the US in May, and the US team will visit the USSR either in July or August.

CONCLUSIONS

1. The cultural and scientific exchange programs are very beneficial to both the US and the USSR.

2. It is imperative that the political systems and problems associated with world affairs remain unassociated with these exchanges.

3. Technology transferred by these programs will benefit both countries.

4. Increased fellowship and professionalism will foster better relationships, increased understanding, and peaceful existence during the present and future.

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3. Protocols of the First, Second, and Third Working Group Meeting of the American and Soviet Specialists on Project II-3, "Plastics in Hydrotechnical Construction," Part II-3-4, "Utilization of Polymer Concrete in Wear- and Cavitation-Resistant Linings of Hydrotechnical Structures and for the Repair of Concrete Structures," 24 June 1977, 14 October 1977, and 23 May 1978, respectively. (Author's records)

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Scanlon, John M
US-USSR scientific exchange program in the field of polymer concrete / by John M. Scanlon. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1979.
9 p. ; 27 cm. (Miscellaneous paper - U. S. Army Engineer Waterways Experiment Station ; SL-79-3)
Prepared for Office, Chief of Engineers, U. S. Army, Washington, D. C.
CTIAC Report No. 35.

1. Polymer concrete. 2. Scientific exchange. 3. Technology transfer. 4. US-USSR scientific exchange program. I. United States. Army. Corps of Engineers. II. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Miscellaneous paper ; SL-79-3.
TA7.W34m no.SL-79-3